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ABSTRACT

A review of research literature on the subject of dyslexia printed since 1955 is presented, concentrating on the interest in the subject during the late 1960's. The authors initially admit that precise definition of the term dyslexia is quite impossible (they use the term to mean the inability to read) and devote chapters to describing problems related to definitions, problems of diagnosis, and treatment approaches to dyslexia. By taking this approach, the authors propose to construct an analytic framework for use by future theorists and researchers. The monograph is one of a series of ERIC/CRIER "state-of-the-art" papers, and is thus intended to be a review of research in a general area with conclusions about the present state of knowledge in that area and discussion of implications for future research. Selected annotated references are included. (MS)

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Dyslexia: definition or treatment?

Virginia L. Brown
University of Minnesota, Duluth
Morton Botel
University of Pennsylvania

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Chapter 1
INTRODUCTION AND PERSPECTIVE

The word dyslexia, both in its derivation and broadest sense, refers to the inability to read. Such a reference point for beginning a monograph is not without its problems. While there is no question that dyslexia applies to the inability to read, there is a great deal of controversy surrounding the specific nature of that inability. Some claim that the term applies to any and all cases of reading disability. Others use the term to refer only to those instances in which the disability is presumed to arise, either directly or indirectly, from constitutional disorders of neurological origin. Many others refuse to use the term at all. The present monograph analyzes the bases for and implications of such divergent positions and reviews the trends which are becoming apparent in the field of reading disabilities.

It is customary to justify the preparation of a monograph dealing with a problem area on the basis of precise definition of the descriptive term and documentation of the magnitude of the problem defined. Such an approach to a monograph on dyslexia is not professionally possible in spite of the existence of a substantial body of literature. It is fundamentally a literature of opinion and as such has not produced the accumulation of knowledge necessary to provide a foundation for confidence in instructional procedures. Much of the research in the past has failed to meet current criteria of scientifically acceptable practice. There has also been little evidence concerning the descriptive variables related to dyslexia so that incidence figures or epidemiological statistics among the general population are matters of conjecture. Varying estimates have been made to the effect that from one to thirty per cent of the American population is dyslexic.

National professional attention now appears to have taken a turn away from the nonproductive controversy of definition and incidence, toward the problems of providing service improvement. This trend was substantiated by the formation of the National Advisory

Committee on Dyslexia and Related Reading Problems by the U.S. Department of Health, Education, and Welfare, in August, 1968. The Committee members represented diverse and divergent viewpoints concerning the nature and ramifications of the term dyslexia. In the final report issued by the Committee (Templeton, 1969), no definition was adopted. Instead, there was a focus upon the general problems of obtaining needed service for a variety of children who might be called dyslexic. The nature of that service, however, is still to be determined through research and training.

Research and training questions revolving around the existence of a population whose reading difficulties may be caused by neurological imperfection are likely to continue. Even if such research does succeed in establishing neurological evidence underlying reading disability, such an etiological classification may prove to be the least important outcome of the debate that has raged over the existence or the nature of dyslexia. The controversy in the field has already had an important and immediate effect in that it has been a factor in stimulating the current scientific assessment of reading instruction. This assessment has called into question past and present methods, materials, and procedures for managing the instructional situation, and it has begun to provide numerous alternatives to traditional approaches to reading instruction. Whether or not the alternatives become mere substitutes for terminology now used, or whether they acutually produce more efficient and effective replacements for or supplements to current practices is yet to be determined. The present monograph has been developed in the light of the past and present conceptualizations of the importance and the impact of the study of the phenomenon called dyslexia.

Historically, interest in dyslexia converged from the various branches of preventive and rehabilitative medicine, from remedial reading, and from the field of learning disabilities in special education. It has since grown to include professions that are tangential to the field of reading behavior per se, including those studying the sociological, psychological, political, and economic effects of reading failure. The recently established Journal of Learning Disabilities which deals with dyslexia and other types of learning problems regularly lists 24 broad disciplines represented in its publication, among which are pharmacology, social services, clinical administration, and anthropology.

In addition to historical interest, a variety of complex sociological factors have operated to legitimize the area of severe reading disability as one engaged in becoming a profession with

its own convention, journal, terminology, etc. The affluence of technologically developed countries has favored specialization of services, training, and research interests. In some regions personnel were trained to work with the ad hoc problems of severe reading disability, and others then chose to study these problems through replication, extension, or modification of their experiences. The known availability of specialized personnel, both direct and ancillary, has increased the service demand, and this demand in turn has been supported by state certification and local district reimbursement policies. Advancements in the organizational and administrative patterns of schools have changed the nature of expected service, as have changes in teacher education and current development. Interest in interdisciplinary communication has been encouraged and made possible through improved techniques of information collection and dissemination. Popular literature and parent groups have given impetus to publicity designed to attract increased public philosophical and financial support for improved service efforts. People who have gained status through the presence of and respect for specialized terminology, training programs, and communication channels of professional organizations and literature have become an "in group."

If both direct history and broad sociological influences have produced people who understand, at least to their own satisfaction, about the complexities of dyslexia, there is an audience for whom a general understanding of the uses and implications of the term requires interpretation. It is to this audience that the monograph should be of most interest and value. Both research and opinion regarding educationally relevant aspects of the dyslexia controversies are included, although the emphasis on educational issues and problems does not eliminate the need for considering literature from related areas. (In fact, early interest in dyslexia did not originate in the field of education.) Information from areas other than education is included only when it can be considered relevant either by transfer or by generalization to the improvement of educational practice. It is recognized that such an approach has inherent difficulties if only because of the hypothetical interrelationships of all knowledge. Information from fields other than education undoubtedly contributes significantly to the improvement of educational practice. There is little doubt, however, that there is currently sufficient knowledge base to assist practitioners in designing and implementing programs which can reduce the debilitating effects of reading disabilities, regardless of whether that disability is considered to be dyslexia by all members of the profession.

The data base for the present review was obtained from the ERIC/CRIER collection of research in reading, including the Current Index to Journals in Education, Research in Education, the popular literature, and government documents, and from miscellaneous resources available to the authors. Systematic emphasis has been placed upon the necessity of separating acceptable evidence from opinion, however widely held that opinion might be.

This monograph focuses on literature published since 1965 and culminates with the report of the National Advisory Committee on Dyslexia. The time choice was deliberate since previous literature is readily available and has been adequately reviewed elsewhere (Farr, 1969; Strang, 1968). The monograph concentrates on projects carried on in the latter half of the 1960's because this is the period in which wide public and professional interest has been developed and during which the controversy over the term dyslexia and the host of issues its use represents has had its strongest impact upon the totality of reading instruction.

Two other State of the Art Monographs published by ERIC/CRIER-IRA are relevant to the present paper. Reading Diagnosis and Remediation (Strang, 1968) is not replicated here but is referred to as a review of general reading disability. Reading: what can be measured? (Farr, 1969) is also germane because of the importance of measurement considerations in the controversies regarding the meanings of inability and read.

The present treatment of literature is intended for a general audience with the recognition that in some cases the beginning practitioner will have difficulty following the technical language that has grown into a tongue-twisting proliferation of terms. A suggested introductory annotated reference list is provided at the end of this monograph to encourage the beginning student in identifying and examining the most representative or historically important literature of the area.

This introduction has described the problems of treating a monograph on dyslexia. Argument regarding proper terms is considered to be indicative of a young and as yet unstable scientific base. The introduction has also suggested that diverse professional, historical, and sociological factors have served to bring about wide interest in the controversial aspects of the questionable literature. The same literature has simultaneously built an awareness of the need for changes in reading instruction, especially that of a remedial nature. Because of such a dichotomous impact,

interpretation of the controversies is needed to assist those who are conscientiously charged, perhaps prematurely, with application of a particular opinion-based treatment. The remainder of the monograph has been organized to supply such interpretation.

Chapter Two provides additional detail about the problems of definition and etiology. An enlarged discussion of this controversial area is basic to understanding the various implications for derivative treatment strategies. In the third chapter, literature dealing with diagnosis, both performance and process, is reviewed. Both traditional and a reformulated diagnostic-treatment process which has emerged from the study of reading problems is described in Chapter Four. Here trends in working with those who are highly resistant to conventional treatment practices are emphasized, along with implications for prevention of reading disability. The final chapter reviews the important strands of the monograph, delineates trends in viewing dyslexia and its ramifications, and suggests further areas of study. Specific suggestions for research are provided at appropriate points in the discussion.

A thorough reading of the monograph and the material in the suggested introductory bibliography should equip the reader to be in a more knowledgeable position to evaluate for himself the future literature and discussion of dyslexia-related issues and problems. It is not intended that all readers should arrive at the same theoretical positions in regard to the controversies which will continue to exist around "dyslexia--the inability to read." It is intended that most readers will adopt the perspectives of caution in accepting narrow interpretations and confidence in the ability of practitioners to understand the factors which have created an unnecessary dyslexia mystique.

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Chapter 2
PROBLEMS IN DEFINING DYSLEXIA

The adequacy of any one definition of dyslexia has been the prime area of controversy in the field of severe reading disability. Arguments purportedly demonstrating the superiority of one definition over another have not been at all comparable. Complicating the problem has been the confusion of etiologies, or search for causes, with symptomatology, diagnostic criteria, classification boundaries, correlated characteristics, and factorial dimensions. Yet, the definition controversy remains important because of the role that definitions play in determining treatment. This is particularly true of a service-oriented profession such as education. Treatment decisions in and of themselves have consequences for the conduct of the total educational program, the training of professional personnel, the allocation of local resources, and the nature of the research effort required to improve the entire service delivery system.

The problems of definition are not unique to the field of reading, nor to education as a whole. Wechsler (1958), writing about intelligence tests, reflected that some psychologists found themselves "in the paradoxical position of devising and advocating tests for measuring intelligence and then disclaiming responsibility for them by asserting that 'nobody knows what the word really means'" (p. 4).

The philosophical problems intrinsic to developing adequate definitions are not the central concern of this monograph. The authors are aware, however, of the existence of a comprehensive literature setting forth criteria for definitional statements. Hempel's (1952) Fundamentals of Concept Formation in Empirical Science provides an excellent introduction to the subject.

DEVELOPMENT OF DIAGNOSTIC DEFINITIONS

The philosopher may be interested in "real" definitions, or the physicist in the extra-logical terms of scientific theories. The service-oriented educational practitioner is likely to be concerned with a definition which might be called diagnostic in the sense that it involves statements of criteria for service inclusion or exclusion and suggests the nature of the treatment procedures or service practices.

When an ambiguous problem such as dyslexia is newly presented within a service-oriented profession such as the field of medicine, the problem is observed for a while until it is determined whether or not people within the field have an interest in working with it. If there is a legitimate interest, the problem is defined according to the tenets of that profession. Then, once a tentative definition is available, numerous "cases" of the problem are discovered if only because other diagnosticians now have available to them yet a different alternative for labelling a particular phenomenon. The definition then becomes more public. People from other professions such as education or psychology, and some within the originating profession, interpret it differently and refine it in terms of their own observations or capabilities for working with the problem.

As formal organization of the services increases, both the service provided and the definition may become locally set. Usually if this occurs, only those who are responsive to that particular service are considered to "fit" the definition, giving rise to a tendency toward postdictive diagnosis. Other explanations or definitions are sought for those who do not fit the service. It might also happen that service and definition are incongruent, and yet this mismatch is comfortably understood by the working staff because the child can be helped by that service regardless of the definitional label.

At some times, then, a definition involving diagnostic criteria is the result of having a treatment service available, and at other times the treatment service is a consequence of having a definition available. The exact relationship at any particular time or place is a function of when within the sociological process called "institutionalization," or becoming formally organized, the definition happens to become known.

With these "problems" inherent in definition in mind, it is possible to turn to specific definitions offered for dyslexia and to analyze their implications for treatment.

GUIDE FOR ANALYSIS OF DEFINITIONS

The way in which service and definition interact can be explained with reference to a guide presented in Figure 1. The guide lists elements found (or not found) in typical definitions of dyslexia. These elements usually include a characteristic and/or its presumed correlates; whether these are observable or inferrable; present or absent; and the degree or levels of severity. Sometimes an etiological statement is made to the effect that the cause of the phenomenon is within the learner, is within the instructional milieu, or represents a combination of both. The definition may also suggest a prognosis for changing the condition, and it usually states the author's opinion about factors to be excluded so that these potential "causes" may be eliminated from primary consideration.

A definition used by Eisenberg (1966) is illustrative as he explains, "Operationally, SRD [specific reading disability] may be defined as the failure to learn to read with normal proficiency despite conventional instruction, a culturally adequate home, proper motivation, intact senses, normal intelligence, and freedom from gross neurological defect" (p. 14). This definition presents both a characteristic and its degree of severity as well as six exclusion factors. Given this criterion, if a culturally inadequate home or unconventional instruction could be defined and shown to have existed, a "diagnosis" of SRD could not be made according to the definition given.

The elements within definitions of dyslexia as presented in Figure 1 are the bases on which this chapter is considered. A close examination of these should clarify some of the problems inherent in developing definitions of dyslexia. Each element--characteristics, correlates, severity, etiology, exclusion--is considered separately below.

Figure 1 Dyslexia: guide for definitional analysis

Guide	Examples	
	Gunderson[a]	Critchley[b,c]
1. Major characteristic	reading	visual interpretation of verbal symbols
a. Present or absent	absent	absent
b. Observable or inferrable	inferrable	inferrable
c. Degrees or levels of severity	commensurate with intellectual abilities	hard core
2. Presumed correlates	writing, spelling	writing
3. Etiology a. internal b. interactional c. external	individually determined	ideopathic, but inherently neurological
4. Prognosis for change	none stated	with appropriate techniques can be taught to read with fair accuracy
5. Exclusion factors	a. poor instruction b. specific neurological disease	a. mental backwardness b. psychological problems
6. Other comment	synonomous with reading disability	a. suggests sight word method may be contributory b. recommends removal from failure situation

[a] Gunderson, Doris V. Reading problems: glossary of terms. Reading Research Quarterly. 4 (4), 1969. P. 538.

[b] Critchley, M. Developmental dyslexia. London: William Heinemann Medical Books, 1964.

[c] Critchley, M. Isolation of the specific dyslexic. In A. H. Keeney and Virginia T. Keeney (Eds.) Dyslexia: diagnosis and treatment of reading disorders. St. Louis: C. V. Mosley, 1968. Pp. 17-20.

Characteristics

Failure with the task of reading is the major characteristic involved in actual definitions found for dyslexia. The manner in which such failure has been determined is not always clear, nor is the nature of the reading task with which the "failure" purportedly occurred. Scores on standardized tests, informal reading inventories, observation of classroom behavior, workbook performance, history of failure, etc. have all been used, at times improperly, to label a child as dyslexic.

While the task of the present chapter is not to discuss diagnosis, it should be recognized that diagnosis has become bound up in definitions of dyslexia. Such a major characteristic as diagnosis in a definition might best be considered in the category of inferred behavior unless criterial data is available to support its use.

Severe reading disability is sometimes stated as a major characteristic, or as a synonymous phrase for dyslexia. Failure with visual interpretation of verbal symbols is also suggested (e.g., Willson, 1968), especially when the verbal symbols refer to alphabetic and possibly numerical graphemes. A problem related to establishing operational meaning to the major terms of a characteristic is the difficulty in determining severity or degree of the characteristic in question. It may be severe enough to warrant recognition but not sufficiently severe to warrant treatment under local service. This particular factor is one of the reasons for concern with a range of services rather than with one special service for a population which is difficult to delimit.

If the primary characteristics offered are difficult to comprehend immediately, it is probably because the specific characteristics stated in a definition depend upon the setting in which the definition is to be used, upon the numbers and training of the personnel involved, and upon their experience and sophistication in working with problems of exceptional children. As such, most definitions of dyslexia are principally of local value.

Correlates as characteristics

In addition to the major characteristics involving reading disability, some definitions provide lists of correlates such as inappropriate spatial orientation of graphemes or temporal order of phonemes, poorly developed body image, visual-motor performance

which does not permit successful accomplishment of school tasks, general language development, etc. There is sometimes an unproven assumption that treatment of correlates per se will concomitantly improve reading performance.

Farr's review of measurement of reading related variables or correlates (1969, pp. 178-211) concludes that research in measurement of such variables is insufficiently developed to be of value for program planning. He further suggests that the validity of the tests used be established on a basis other than that of correlation, for the predictive power attributed to the various tests has not been proved.

Remedial textbooks consistently review the research dealing with correlates of reading disability, usually concluding also that the information currently known is insufficient to use as the basis for program planning (e.g., Bond and Tinker, 1967). Correlate-based programs continue to flourish in spite of the absence of a sound research literature.

A cursory glance at the literature might even imply that correlation is equivalent to causation. Strang, for example, titles a section of her chapter on dyslexia, "Correlates or causes" (1968, p. 78). She later states that "causal relationship is difficult to prove" (p. 79). It should be remembered that a presumed cause must be correlated with but must also precede the presumed defect when other alternate causes are controlled or accounted for.

Concern for preventing the personal, social, and economic effects of dyslexia has led practitioners to reject models of reading disability which require a history of failure in favor of providing preventive programs. One type of early intervention model assumes that correlates of reading disability can be used as predictors of reading achievement. Training of correlative behaviors may therefore become the preventive program. Theoretically, through the use of correlates, a population could be defined, identified, and treated for "reading" without ever using materials involving alphabetic symbols.

Correlate-based programs have been of value in "ruling out" factors which might interfere with the acquisition of reading skills. It is not certain whether special programs are needed to train such correlates of reading behavior, or whether these activities are already available to the regular program. Palmer (1970) has analyzed traditional basal "readiness" programs and found that they

contain many activities of "special programs" such as that of the Frostig (1964). However, it may be that such activities have been neglected in favor of other use of the time allotments available to the classroom.

Preoccupation with correlative characteristics might be detrimental where correlation is considered either as causation or as the target behavior of program development and where that target behavior might more appropriately be directly related to reading performance. In practice, a predictive measure may be considered so predictive that difficulty with the correlate, such as eye-hand coordination, could preclude entry into a direct reading program.

Severity, prognosis, and duration

Instructional factors are often used to suggest that a child has not responded to adequate instruction (e.g., Eisenberg, 1966). What constitutes adequate instruction for a particular child, however, is by no means clear, especially in such vague definitions. The instructional factor is directly related to severity and to prognosis.

Critchley (1964) has suggested that the definitional criterion, in spite of proper instruction, be improved by substituting the word conventional for proper. The placement of the criterion of resistance to instruction implies that a thorough history of the instruction the learner has so successfully "resisted" and a description of the situation to which he would be assigned become a vital part of determining treatment service.

Closely related to instructional factors is the question of the duration of the condition within an individual, for persistence is considered to be a primary indicator both of the existence of dyslexia and of the severity of impairment. It has been the traditional indicator of the prognosis for responsiveness to remedial efforts.

Persistence of the condition is of questionable criterial value because a diagnosis of dyslexia in which it has been "understood" that the condition would persist into adulthood might have deterred systematic application of intervention measures. Case studies of adult dyslexics have relied upon retrospective reminiscence, with no known longitudinal studies of exhaustive

treatment alternatives having been applied to a single person in a scientifically acceptable manner.

Without recourse to various treatment conditions it is impossible to state accurately duration, severity, or prognosis. Yet, the service consequences associated with duration, severity, and prognosis are primary considerations in using the resources of the schools in a way that should be of maximum human return for the costs involved. Thus a district with limited resources would be likely to choose to give first service priority to those retarded readers who showed the most "aptitude" for improvement within the service the district chose to, or could, provide. When services are being initiated and it is known that results of an immediately observable nature will determine continuance of that service, a deliberate decision might be made to exclude severe cases of poor prognosis until widespread support is obtained for the program in general. While such decisions are irrelevant to service need, they are relevant to problems of obtaining service delivery.

Etiologies

Etiology is concerned with cause-effect relationships, preferably demonstrable through the establishment of experimental variables. If an entity of dyslexia could be identified reliably, it should eventually become amenable to understanding, in the sense of prediction and control.

Medical interest in prediction and control has provided a scientific analogue that is potentially useful to the educator. At times the medical preoccupation with etiology has been misinterpreted and ill-adapted by educators who have been content to hypothesize a medical cause for an educational phenomenon without understanding that prediction and control are the reasons for interest in etiology. For example, a doctor might say that a person died of "rabies," while actually assuming that his audience was aware that the person died as a direct function of the introduction of a specific virus into the organism. Knowing that the introduction of that virus will result inexorably in a certain sequence of events, an antivirus can be administered to a patient in order to prevent the occurrence of that sequence of symptoms labelled "rabies." Furthermore, knowledge of how the virus is transmitted enables the prevention of its introduction, and consequently the symptoms called "rabies" (Staats and Staats, 1963).

The medical analogue, however, is not totally applicable to education. It is usually considered neither advisable nor desirable to experimentally "produce" cases of severe reading disability, as has been done with the phenomenon of stuttering (Flanagan, Goldiamond, and Azrin, 1958). With direct manipulation of variables unavailable as a technique for determining the etiology(ies) of dyslexia, research personnel have had to rely upon methods of indirect proof.

Both the historical reconstruction of events and/or factors which might have been instrumental in producing reading disability and the investigation of concomitant factors and/or events have been primary methods of indirect proof of etiology of dyslexia. Neither has been completely successful; yet each has had treatment consequences at times out of proportion to the validity of the inference made. An examination of several representative definitions of dyslexia shows the extreme range of etiological orientation, from internal to external to interactive.

Three basic etiological positions are identifiables: the internalist, as distinct from the others, places the origin of dyslexia within the learner. The externalist sees dyslexia as an environmentally caused phenomenon. The interactionist considers roots both in the environment and the learner. While treatments may actually be similar regardless of which etiology is considered, the distinctions are made here on the basis of presumed origins and the assumption of these three diverse positions. Each is discussed in more detail below.

The internalist etiology. A recent publication of the National Institute of Neurological Diseases and Stroke, Central processing dysfunctions in children: a review of research (Chalfant and Scheffelin, 1969), several times emphasizes the internal nature of minimal neurological dysfunction as reflected in various behavioral syndromes. Both of these authors and Masland (1969) in the preface to their review, emphasize that environmental factors are not responsible for the problems the child so labelled encounters.

Treatment consequences of a neurological etiology position vary. If poor neurological organization is thought to manifest itself at a critical time in a child's development, a return to the presumed developmental level and reteaching of successive perceptual-motor tasks are considered necessary prerequisites to formal reading instruction (e.g., Delacato, 1966; Kephart, 1960). Others consider that instruction may continue, but in altered forms to account

for alterations of learning processes (e.g., Johnson and Myklebust, 1967; Strauss and Lehtinen, 1947).

Several authors (e.g., Cohn, 1964; Reed, 1970) have provided interpretive reviews of the evidence for the minimal brain dysfunction syndrome. Reed (1970) in examining the evidence for teaching brain-injured children to read suggested that without evidence of brain damage per se, the diagnosis of brain injury becomes a self-fulfilling prophecy. He concluded that there is insufficient assessment of the quality of the medical criteria used in the documentation of brain damage to warrant the radical changes in life-style which are frequently recommended when such a diagnosis is made. Cohn (1964) had earlier questioned the validity and reliability of the neurological assumptions. Critchley (1964) has also discounted the minimal brain dysfunction construct as a major source of reading difficulty, but because it failed to account for what he believes to be a genetic component in dyslexia.

Localization of cortical function has been a topic of related concern. An excellent review of the history of this controversial problem (Krech, 1962) concludes that there is insufficient evidence for advocating any one position over another.

The interactionist etiology. Maturational lag (e.g., de Hirsch, Jansky, and Langford, 1966) as an etiological explanation is an example of an interactive, correlate model based upon the assumption that differences in the rate of development have been responsible for poor response to the school environment structured for normally developing children:

> The clinical impression of these youngsters was one of striking immaturity. Their performance resembled that of chronologically younger subjects not only in oral language, but also in a variety of perceptuo-motor tasks. So frequently was this pattern encountered that it raised the question of whether neurophysiological immaturity, as reflected in relatively primitive perceptuo-motor and oral-language functioning, might be linked to subsequent deficits in reading, writing, and spelling, all of which require a high degree of differentiation and integration (1966, p. 5).

The maturational lag position is closely related to developmental psychology which is primarily concerned with the nature of the organization of responses as that organization changes over time

(e.g., Zigler, 1963). If a child who read word by halting word changed to reading smooth phrases, it might be inferred that organizational changes had occurred in the way he either viewed or was able to carry out the expected task.

The internally posited supraordinate mechanisms responsible for transition from one stage of development to another of increased complexity are considered to be developed through a combination of internal change over time and through change structured by the environment. Programs based upon notions of developmental lag are frequently called "transition" programs to reflect their theoretical origin in developmental psychology, although as popularly used, the term refers to a "transition" between kindergarten and first grade.

Children who are considered to be "lagging" in development are usually given a prolonged period of "readiness" instruction before they enter the mainstream educational program. Such a readiness program frequently, but not necessarily, consists of training in perceptuo-motor and general language behaviors. Its activities are often structured around "age norms" rather than actual observation of the child's developmental level. It should be noted parenthetically that where such programs have proved necessary, provision must be made for the primary teacher either to make judgments or to carry out these judgments regarding the appropriate time to begin formal reading instruction for a particular child.

The particular aspects of development which are emphasized in a particular program depend strongly upon the biases of the personnel who make the diagnosis of developmental lag. The techniques used are frequently generalized rather than specifically oriented to a particular child. This is necessary because few program users are sufficiently sophisticated in the theory or application of developmental psychology to modify preplanned group treatment programs and because of the dependence upon available tests as bases for program planning.

The unobservable nature of the internal cognitive structure makes it difficult to determine the effect of any of the programs built around the concept of maturational lag except by changes in presumed correlates of cognitive development. Problems involved in the use of correlates have been suggested previously in the present chapter.

The externalist etiology. The external etiology position is not found in the literature of dyslexia because the ultimate implication of the exogenous or environmentalist position is that there need not exist an entity of dyslexia if it proves to be amenable through specialized instruction. Professionals in this area simply do not choose to define dyslexia at all. Because of an unwillingness to believe that any such condition need exist, the externalist views deficits within the instructional situation to be primarily those of the teaching conditions. Teaching would include all instruction which occurs either deliberately or accidentally within the totality of the child's environment.

Treatment consequences are primarily concerned with changing the essential condition under which dyslexia might be "diagnosed," i.e., reading performance (e.g., Haring and Hauck, 1969; Homme, 1966). If a program has been unsuccessful in teaching a child to read, it can be said that the program is not accountable for producing change because of something unobservable within the child. The environmentalist position would consider the program to be at fault and correctable to the point that the child would succeed at the given task.

Bloom's (1968) concept of mastery learning, Gagne's (1965) interest in the conditions of learning, and the trend toward accountability have all been influential in suggesting that most children can learn, given the appropriate individually tailored program. Because of the actual centrality of the learner in determining exactly which aspects of the environment should be changed or modified, it is doubtful that "external" is the proper term to describe interest in the instructional situation except in its most theoretical sense.

An apparent contradiction in the previously noted statement by Masland (1969, p. iii) about the different "child" rather than the different "environment" occurred when he continued to discuss the rigid imposition of arbitrary standards of educational achievement and the inability of some children to cope with those standards. Specialized instructional practices were recommended to assist the child with his coping. Interestingly enough, the focus upon special arrangements of the environmental condition, instruction, is recommended by proponents both of the internal and the external etiology positions. Both would agree that individualization of instruction occurs when a child's current level of functioning is used as a basis for moving to a level of increased competence or complexity. They differ, however, in that the internalist focuses upon hypothesized unobservable constructs or variables to account for

the behavior under consideration, while the externalist is concerned with determining functional relationships among observable behaviors.

Problems in emphasizing etiology. Treatment does not necessarily stop because the exact etiology of a reading disability remains unknown. While the search for etiology(ies) continues, treatment procedures continue to be developed for prevention and intervention. It sometimes happens that a child is excluded from instruction altogether until etiology, or the "real cause" of failure is established. (If a poorly designed program is the student's only instructional alternative, such a measure might indeed prove to be the most appropriate "treatment.") Concern for prediction and control does not preclude interest in the development of treatment strategies.

Educational priorities are assigned in terms of personnel, time, and financial allocations. If educators assign priorities to traditional etiological investigations to the exclusion of concern for treatment, valuable resources are potentially lost to the improvement of the instructional milieu. Such an outcome would be especially unfortunate in view of the fact that the need for well-considered differential intervention is the one area in which divergent views are united.

The present authors view the traditional controversy about the etiology of dyslexia as important to understand and as gravely misinterpreted by the educational community. They discount none of the tentative positions and yet believe that if the search for a universal etiology should continue, it would be unlikely to yield improvement in instructional practices.

In taking a position regarding etiology, it would seem that from the point of view of the educator, interest should be focused upon environmental modifications based upon careful, precise observation of the responses of the child. In this sense it would be considered interactionist in nature.

Classification systems

The terms etiology and classification are often used interchangeably in the literature, but it is necessary to differentiate between them. Etiology is concerned with the establishment of causal relationships. Classification is the determination of the boundaries within which certain forms of reading disability can be

categorized, and categorized in such a way that the criteria for inclusion are mutually exclusive, yet aggregately exhaustive of the possibilities available. Etiology may or may not enter into the classification scheme.

The three classifications suggested by Rabinovitch (1959; 1968) include presumed etiology as well as symptomatology, correlates, and severity. The first level, primary reading retardation (developmental dyslexia), refers to problems with integration of the meaningfulness of written material, especially letters and words. No history of brain damage should be present, although the problem would seem to be of neurological or internal etiology. The second level, reading retardation secondary to brain injury, refers to problems resulting from known brain damage. The third level, reading retardation secondary to exogenous factors, involves intact capacity to learn to read but suggests that a discrepancy between achievement level and expectation has occurred because of a variety of external factors (1968).

In the Rabinovitch scheme demarcations between or among classes are tenuous at best. Most classification schemes in reading are meant primarily as tentative groupings with an eventual implication for differential treatment. Independence of categories is seldom achieved (Money, 1962), and classification itself is an abstraction process which does not inherently suggest an appropriate treatment unless the categories are empirically, functionally verified.

Exclusion factors

Decisions to provide exclusive or inclusive services are always limited by the parameters of the population defined. The parameters in turn may be determined by a variety of factors other than the sheer numbers of children who fit a particular definition. Historically, the decision for treatment of dyslexia was made in a specialized clinical setting. Clinical populations were (and for the most part continue to be) defined, diagnosed, and treated postdictively. Selection was frequently biased in favor of those for whom relatives or school personnel were sufficiently motivated to seek further assistance and who could also afford specialized services.

Service decisions in clinical settings are usually derived from progressive screening of referred clients. Ingram (1960) has noted the tendency for clinical referral to come from higher socioeconomic areas, and Critchley (1968) called attention to the tendency for families to refer boys.

There is a strong emphasis placed upon subjective, experience-based, etiologically oriented judgments in clinical programs. Most professionals who operate in specialized settings continue to suggest that only highly trained personnel are competent to assess the evidence regarding the presence or absence of "dyslexia."

Scores obtained on intelligence tests are invariably used in order to rule out the population of children labelled as mentally retarded (e.g., Monroe, 1932; Myklebust, 1968). This criterion is usually stated for the purpose of excluding a population from additive service resources. In most school districts special provisions are made for the education of psychometrically retarded children. A child can be legally retarded in one state but not in another because of the arbitrary nature of legislation. If scores on intelligence tests are incorporated into an exclusion formula, a child might also be "dyslexic" in one state, but not dyslexic in another. There is also an as yet unsupported assumption that retarded children would be more responsive to the special service for children of psychometrically limited intelligence. It is quite possible that the exclusion of mental retardation from population definitions makes both label and service for dyslexia more attractive to parents.

Cultural deprivation is another excluding "characteristic" used to limit service. However, as with other subpopulations, those who were once excluded from service are now being included as children who would, if seen clinically, be labelled as dyslexic (e.g., Tarnopol, 1970).

The focus in this discussion has been to point out some of the implications of elements in definition aimed at exclusion. The main concern suggested here is that attempts to "define" dyslexia have ultimately led to limiting service while there remain children who have reading disabilities and who need services they are not receiving.

SUMMARY

Discussion in this chapter has been concerned with introducing the practitioner to some of the implications of various elements involved in definitions of dyslexia. If dyslexia has been previously considered to be a specific form of severe reading disability, it has been suggested that a variety of factors have served to prevent

the establishment of one definition or interpretation of that form. The word form has generally been dropped in favor of dyslexia as the generic term for severe reading disability, or possible reading disability, with various hypothesized causes, correlates, and symptoms.

Pragmaticism long ago suggested that the value of definitions is dependent upon how the consequences derived and the operations prescribed add to knowledge. It has also suggested that in some areas it should be considered appropriate to construct a variety of definitions leading to independent consequences. This viewpoint is quite consistent with current trends in educational research which are designed to assist with the decision making function so vital to improved service (e.g., Cronbach and Suppes, 1969; Guba, 1967; Stufflebeam, 1969).

Research definitions peculiar to a specified problem are likely to continue, for whether or not the term dyslexia is retained, severe reading disability will not disappear for some time. One of the problems in examining the literature on dyslexia is that the term is not uniformly used in studies which employ comparable variables or that other terms such as minimal brain dysfunction or learning disabilities are used synonymously with dyslexia. It would seem more appropriate to examine the studies or reports themselves than to study the terms used to describe the study or the discussion.

Research implications

Most research in reading disability deals with the phenomenon itself or with its presumed correlates. One type of research effort which is seldom considered, however, has potential value for understanding what we are about as we advocate another specialized category of "exceptionality." For instance, research might well delve into the historical changes in definitions (as well as their implications) resulting from the pressures of parents, the popular press, professional organizations, and the like. It should also be possible to explore the impact that the label dyslexia and its varying definitions has had on the expectations, reactions, and consequent practices of children, parents, and others involved in the problem situations encountered in cases of reading disability. It may well be the case that labelling for and of itself has had the same serious negative consequences in reading disability that it has had in so many other fields.

Additional reference to the definitional controversy

If the reader should wish to explore the definitional controversy further, he is referred to several reviews published recently. Adams (1969) presents a humorous discussion of definitions of dyslexia. The report of the National Advisory Committee on Dyslexia, (Templeton, 1969) provides an excellent summary review of controversies on both definition and etiology. Finally, Critchley's (1964) monograph places the definitional conceptualizations of dyslexia in a historical light.[1]

In using any of these reviews, the reader is cautioned about distortion that can result from relying on secondary sources and is urged to consult primary sources for an accurate presentation of individual positions: Distortion is not rare--one example is found in Adams' (1969) article in which he omits a key portion of the definition reported by Zedler (1967) of the Working Group on Dyslexia.

[1] An interesting error is contained in the Critchley review (p.8). In a discussion of Samuel Orton's strephosymbolia (twisted symbol), cerebral dominance notions, Dr. Orton is dated as entering "the scene" in 1952. Orton died in 1948, and the date should have been 1925. (Mrs. Isabel Craig.)

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Chapter 3
PROBLEMS OF DIAGNOSIS

The sequence of treatment for dyslexia has usually involved (1) definition, (2) etiology hypothesis, (3) diagnosis, (4) remediation, and occasionally (5) efficacy. These activities have functioned primarily independently, with diagnosis as the pivotal term related to definition and etiology and also closely linked with remedial procedures.

Additional attention will be given in Chapter Four to diagnosis as it relates specifically to remediation. The focus of the present chapter is on the delineation of diagnosis concepts in terms of the problems in establishing a rationale for the selection of elements to be singled out for observation.

DIAGNOSIS AS IDENTIFICATION

One meaning of diagnosis is that of identifying a "disease" from its signs or symptoms. This connotation emphasizes its relationship to definition and etiology. Diagnosis of this sort reflects medical use of the term and implies that once a disease has been identified there will likely be professional agreement about treatment procedures. However, in any scientific field, professional consensus is not always reached unless prediction and control have been reliably demonstrated.

The global naming idea of diagnosis has been of little value in remedial reading because there is no one-to-one correspondence between diagnosis of reading disability or dyslexia and its prognosis for the individual or for the precise specification of remediation procedures. Its use is primarily one of recognizing that some kind of problem requires contact with the remedial service. Naming is, therefore, a potential decision to provide

available service, with the nature of that service unpredictable and dependent upon local factors such as training level of personnel, facilities, etc.

Local school districts may set up procedures for provisional identification of reading problems. The criteria involved in provisional identification range from teacher nomination to sophisticated test-based assessment (e.g., Silberberg, Iverson, and Silberberg, 1969). Diagnosis of this sort is referred to as screening, with further assessment made before deciding to provide service or to determine the nature of that service. Screening models for intervention in severe reading disability usually imply that a problem is already present and in this sense are consistent with illness notions and medical interest. Neither is of value in suggesting the character of remediation.

Early screening. Early screening is used to provide differential early programing for children considered to be of high risk when formal reading instruction is begun. Such endeavors usually assume that once a "readiness lag" is made up, normal instructional procedures can be initiated with success. Less frequently it is assumed that children so identified will need continuous surveillance throughout their entire school careers.

Hill (1970) has classified early screening models into four general categories: illness, immaturity, poor coping, and environmental match-mismatch. Illness and immaturity have been discussed in Chapter Two.

The coping model, however, suggests that a generally agreed upon crisis has occurred in the child's life, causing a disruption of expected growth. Entry into the school situation from the home might be an example of a crisis situation for some children. Individual prediction of reactions to future crisis situations is difficult at best and has not been pursued at all for preventive treatment in reading, although it has received attention in general mental health (e.g., Ojemann, 1968).

The match-mismatch model, i.e., determining what discrepancies exist between the child's behavior and the behavior expected by significant others in his environment, is becoming of increasing interest as the notion of the child's total ecology receives attention (e.g., Gray, 1963; Lewis, 1966; Rhodes, 1967). The general literature dealing with the mismatch of the "middle-class" teacher

and the "disadvantaged" child provides excellent examples of this point of view.

Adelman (1969, 1970) has suggested that the teacher factor be given increasing attention, to the extent of determining pupil placement for beginning reading instruction on the basis of a pupil behavior-teacher expectation match. Just as individual differences occur in children, so does teacher behavior differ in some important respects. For example, some teachers are more tolerant of "disruptive behaviors" than are others (Kroth, 1969).

If a teacher is reinforced by conforming behavior, such as a descrptive category found on one report card sample, "responds instantly to signals" (Brown County, Indiana, 1970), the active child may be labeled "hyperactive," "inattentive," "emotionally disturbed," etc. and removed from systematic instruction. If idiosyncratic teacher behaviors which would seem to be detrimental to specific children are identified, then either the child could be moved to a more appropriate situation or the teacher could be taught to change her behavior toward the child (e.g., Adelman and Feshbach, 1969). In any case, attention must be diverted from the search for the "ideal" teacher of the "ideal" child toward teaching child and teacher to cope with less than ideal relationships. Computer assisted and programed instruction has been advocated in some instances because the "teacher surrogate" is considered to be relatively impartial in dispensing feedback.

In addition to the role of the teacher as an element to be evaluated within the instructional environment, Severson (1970) reported that teachers administering a variety of early screening instruments responded by using teaching procedures rather than following standardized testing instructions. There was also great variability in the amount of time and thought used in filling out checklists provided. Severson's report would seem to give additional support for the notion of further research in determining the validity and reliability of screening instruments if they are indeed to be useful as indicators of differential program modification.

The growing body of literature dealing with early screening uniformly suggests that teacher nomination from observation of classroom tasks is at least as valid as considering performance on externally produced instruments (e.g., Bower, 1969 for emotional problems; Haring and Ridgway, 1967 for learning problems). Should

this indeed be true, teachers will play an increasingly more direct role in the diagnostic process, but not as formal test administrators.

DIAGNOSIS AS ANALYSIS

Identification is usually based upon what Myers and Hammill (1969) refer to as a "discrepancy model." The discrepancy concept refers to the idea that a child's measured or observed performance is below what various tests or observations suggest he should be capable of doing. Additional analysis is then made to determine why there is a discrepancy and/or how to close the gap between acquired and assumed potential performance.

Diagnosis as identification is closely related to the first portion of the treatment sequence. Another connotation of the term, diagnosis as analysis, is more concerned with remediation and efficacy. It is to this weighting, i.e., diagnosis-remediation-efficacy, that Strang refers when she suggests the need for additional professional attention to the diagnostic process (1968, p. 158).

Status analysis

Two basic types of analytic diagnosis explore the nature of an individual disability. There may be a categorical inventory of the amount of a predetermined content learned by the time of the assessment. The specific content sometimes involves knowledge about what is taught in many reading programs, i.e., letter names, consonant and vowel identification, rules or generalizations, etc. The classroom teacher frequently engages in this type of assessment when she checks progress in workbook activities. An analysis of this sort is not necessarily an indication of reading ability per se. That is, a child may know many generalizations about reading and yet never apply them to or associate them with reading except in a teacher-directed activity. An analysis of this sort is similar to status studies in research literature.

A status determination may also be used to find the range and content of a child's repertoire of response units. These typically consist of isolated sound-symbol correspondences, oral reading characteristics, etc. They are more closely related to actual reading behavior than knowledge about reading.

An example of the second type of status analysis is found in standardized diagnostic tests designed to categorize items known from items unknown, such as specific sound-symbol correspondences. The remedial program which follows a status assessment usually consists of teaching the child classes of items he does not know. His "reading" then is said to improve as he is able to complete a greater quantity of items on the test. How the learner is to be taught is not indicated by information regarding the learner's status.

Individual reading inventories (IRI) are also administered to determine reading status. In addition to the inventory of content, these instruments may provide information about the oral reading errors made by the learner.

Oral reading errors have been classified traditionally according to their "formal similarity," i.e., they have certain response elements in common. These elements are frequently designated by terms such as omission, substitution, insertion, repetition, or hesitation (e.g., Monroe, 1932; Gray, 1967). They are usually assessed quantitatively, and the relative frequency of each error type becomes a qualitative measure of reading behavior.

Errors might be thought of as interfering with expected reading achievement. If the errors were not made, there would be no achievement problem because expected performance would occur. Monroe suggested that persistence of error implies that some factor has interfered with the process of learning to read (1932, p. 34). The use of an IRI to determine static categories of errors offers no better lead to remediation than do standardized diagnostic tests. They do, however, provide at least an opportunity to engage in more detailed observation of the child's behavior during the testing experience.

Seldom has the problem of reliability of an analytic status assessment such as that obtained from an IRI been questioned, and yet when in practice only one observation of the child's behavior is made, "the total range of variability remains undetected" (Lovitt, 1967, p. 234). No reference to stability of baseline procedure or to range of variability of individual performance could be found by the present authors in an exploration of the literature dealing with remedial reading.

Process analysis

A second basic type of analytic diagnosis, process analysis, determines the sequence of steps or structure the individual learner uses to produce the responses he gives. Process analysis is necessary to generate instructional procedures which will assist the individual in acquiring the responses considered as indicative of good reading ability.

There are several reasons for stressing process when studying reading disability. Some children obtain a "right" answer for the wrong reasons. Examples include instances such as these:

1) The beginning reader "reads" pictures rather than words.

2) A flashcard word is identified by a finger smudge.

3) A word is known in one context and not in another because it is carried by the language pattern in one situation and not carried in the other.

4) A child responds to a teacher cue such as a head or hand movement rather than to the "reading" stimuli.

A child might also "know" in one medium and not in another. One child was told that he could not spell jump because his m was consistently undifferentiated from n in his writing. He failed to understand the teacher's insistence that he could not "spell" the word correctly.[2]

Nature of process. A process may take on the characteristics of a unit of content, as in initial consonant substitution. What seems to be one task can actually be broken down into numerous considerations. In diagnosing a child's difficulty with "initial consonant substitution," limited task and status analyses may be performed by the teacher to determine whether or not a child has learned (1) the components of sound-symbol association of the initial consonants, as in /b/-[b] or /k/-[k]; (2) the base word such as rat; and perhaps (3) the new words bat and cat. Seldom, however is process diagnosis used to determine the complex sequence of steps

[2]Additional discussion of error analysis is found in Clinchy and Rosenthal (1966).

theoretically required or used by different children to change rat into cat or bat.

For example, depending upon the language used by the teacher or the program, several potential parts of such a process may be identified. The first part of each word must be separated from the remainder. Problems of isolation of sounds from their phonemic context may arise. Symbols are in spatial orders; sounds in temporal orders. First or initial parts of words may then be interpreted in the different dimensions of space and time. First and last are themselves directional terms which might not be understood by the child. The entire problems of sound blending, semantics, etc., could also enter into process determination.

Few teacher education programs include training the practitioner in analyzing the nature of responses potentially encompassed in a seemingly simple task. Rarely do they include observation of the particular parts of potential process elements which are actually incorporated by an individual child into the sequence he uses.

Misinterpretations of process. The notion of process seems straightforward, and yet the diverse interpretations attached to process assessment render it currently somewhat ineffective as a basis for the development of useful, comprehensible treatment procedures. In practice, a correlated performance test may be substituted for an achievement test and labeled as process. For example, one psychoeducational report explained that a child's real problems involved linguistic "processes" because he scored in the lower range of an Illinois Test of Psycholinguistic Abilities (ITPA) subtest. In addition, he did not know his telephone number. Neither piece of information suggests a valid description of process.

Sometimes process is equated with sensory modality, as in reference to a visual rather than an auditory "process." While it may be useful to know a preferred or more efficient channel of communication, the key to process is action in a sequence, and exact action sequences involved in a particular use of vision have not been described by this meaning of the term.

Positive interpretations. Instances of what process is not might be pursued at length, but positive denotations are more likely to lead to improved service to children. Dictionary

definitions suggest common elements of continuous action occurring in a series or special order with the expectation of an end or result. Sometimes the ideas of naturalness and of gradualness are introduced, and in manufacturing there is the interpretation of treatment involving an artificial modification designed to produce a uniform product. The industrial meaning is especially interesting in the sense that it is sometimes suggested that many children experience "learning disabilities" only because the educational system allows little tolerance for variation in "processing" children. The expectation of a uniform product obtained through the most efficient procedure is the industrial and military analogue against which much criticism of the educational enterprise has been directed.

The dynamics of process may be considered infinite over time, as in a physical growth sequence, or as infinitesimal as the uttering of a single syllable. In either case, both the diagnostic problem and the diagnostic utility lie in the necessity to (1) describe the action, (2) stop pieces of that action at appropriate points, and (3) to subject each piece to the kind and power of magnification essential to comprehension. Such magnification may be sensory in nature, as with still and time-lapse photography, with sound sprectrography, and with audio tapes. It may also be conceptual, as in the reconstruction of the extremely complex sequence involved in substitution of initial consonants. In some ways this is precisely what is essential to performance assessment. A process framework, however, demands that any single performance be evaluated only within its relationship to preceding or subsequent functioning.

It could be argued reasonably that there exists no performance which is independent of process. Some interpretations of process refer to its illusory quality, much as a motion picture results from the rapid sequencing of a series of discrete, still pictures. Performance may be one frozen frame viewed at a given time, but in need of spatial or temporal context to make it a part of process.

Process assessment is useful in a way that knowledge of traditional etiology is not. To be aware that a child is brain injured due to perinatal trauma suggests little in the way of intervention. To know that a performance has not occurred because of specified actions, sequencing, or expected result, provides a basis for the design of alternatives more likely to produce that performance, whether the process be biomedical, psychological, or educational. Bigge (1970) has designed an experimental training program of films

and guide to teach the teacher to assess both acts and sequence in analyzing a performance deficit.

The key to understanding process assessment is found in the ability to understand functional relationships. Sometimes a process takes on performance characteristics to such an automatic level that change is nearly impossible to effect, even though a process examination reveals that the components are not serviceable. In remedial reading, there is an assumption that knowledge of a phonic word attack process will lead to improved word decoding. For some children, however, a phonic approach never leads to the desired outcome and may in fact result in an aversion to reading. If a classroom methodology has been ineffective, and if a locally popular remedial methodology has been ineffective, then different actions, different sequences, or different outcomes must be explored. It is in this framework of alternatives to total sequences, or to process components, that the learning disabilities orientations turns to one of individual differences requiring instructional differentiation; and it is in recognizing and providing instructional differentiation for learning differences that the incidence of reading disabilities will ultimately be reduced.

Investigations of process analysis. An example of process analysis has been developed by Goodman (1969) and others (e.g., Brown, 1970) interested in psycholinguistic processes. A correlate of reading behavior, language structure or patterns, has been shown to be directly related to the errors made by a child as he reads, however limited that reading might be.

Instead of traditional static error classifications, functional relationships of language responses are analyzed at the grapho-phonic, syntactic, and semantic levels. Such analyses seek to determine under what conditions or within what context an error occurs.

Error concepts such as these by Goodman have implied that an entire reconceptualization of the reading process is necessary (1968). Other authors, notably Ryan and Semmell (1969), have given support to the need for reconceptualization of the process of reading. In the area of reading education authors such as McCullough (1968) and Stauffer (1969) have advocated reformulating the traditional content of reading instruction toward a process approach.

Studies of strategies for using context clues, e.g., Ames (1966) and Quealy (1969) have been made, but primarily with older readers. Marchbanks and Levin (1965) have looked at process as they investigated the importance of consonant position related to word length to determine strategies employed by beginning readers in an experimental context. Durkin (1966) described the processes used by preschool learners in her study of early reading. None of these studies has been specifically concerned with reading disability, and yet all are scattered examples of interest in process as they attempt to delineate actual learner activities in sequence toward a specified goal.

Trial remediation is emerging as a diagnostic tool for making inferences concerning the process the child uses. This technique is closely related to error analysis noted previously, as well as to the experimental analysis of behavior as used by psychologists.

Problems in implementation. Process assessment is extremely difficult to implement at this time for several reasons. Teacher preparation programs do not have "trainers" who are adequately educated to the point of view or to the range of training techniques. Few leadership personnel are being prepared for such a gigantic task.

Previous learning history of teachers themselves interferes with learning a completely different framework regarding diagnosis. In this sense, the state of the art of process analysis is analogous to that of mathematics education when "new math" began to arrive. Textbook materials and standardized tests are not geared to process analysis. The input and impact of publishers of educational materials remain a powerful source of influence on practice.

Related to the previous consideration is the problem of having available a task analysis for frequent tasks in reading. No known analyses of process, such as those of Gagné (1965) and Davies (1968) suggested, have appeared. Their approach would mean identification of a task in terms of experimentally defined and teachable processes such as chaining, concept formation, etc.

Because of the nebulous aspects of process analysis, it is not expected to revolutionize current practices. It is emphasized in this monograph because of the belief that it will ultimately produce true diagnostic teaching.

The practitioner must meanwhile begin questioning the content of traditional courses in developmental and clinical reading. A

thorough grounding in the primary literature of authors such as Goodman (1968) is necessary to attain a more sophisticated understanding of the process concept.

SUMMARY

Diagnosis has been viewed as the pivotal segment of the treatment sequence for reading disability. If an identification connotation of diagnosis is used, it is a part of a definition-etiology weighting. If it is considered as analysis, it is more closely related to remediation and efficacy.

Analytic assessment may be concerned with the status of the learner or with the processes he uses to learn. Process is considered to be the area likely to receive additional professional attention in the future, and hopefully, it will eventually change the content of traditional reading programs.

The discussion in this chapter has been directly concerned with reading assessment, but it should be recognized that the same concepts readily apply to related areas such as handwriting and spelling, or to sensorimotor development. Chapter Four presents an examination of traditional remedial procedures as well as more specific applications of process assessment and its relationship to remediation and efficacy.

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Chapter 4

TREATMENT APPROACHES

Trends in the provision of service for problems encountered in learning to read have been greatly influenced by clinical experience. Conditions of service have shifted from remedial to preventive programs, from a clinical to a school base, and from tutorial to group instruction. An analysis of clinical experience has also provided the content for an emergent movement toward what might be termed the "behavioralization" of the instructional process itself as it is employed in developmental or remedial programs.

The historical literature of treatment programs for dyslexia has been extracted from case studies and from techniques associated with specific individuals. More technical delineation of the clinical process is derived from experimental psychology. The discussion of treatment is organized into two distinct sections in order to provide an overview of various representative treatment approaches and to present ideas regarding possible recasting of the clinical process.

HIGH VISIBILITY APPROACHES TO TREATMENT

A distinction is made in this section between procedures designed to be corrective in nature and those recommended for severely disabled readers. Corrective programs are considered to deal primarily with providing supportive activities for an ongoing developmental program to accommodate minor variations necessary for individual children. Remedial situations, however, suggest that the developmental program itself must be vastly altered in terms of instructional processes (Brown, 1967).

The focus of the procedure described initially is limited to the second concept, or to the greatly altered practice. The first

group of methodologies deals directly with material involving the use of alphabetic symbols as they form the visual base of each program.

Representative clinical approaches

Clinical procedures have traditionally been used for a tutorial situation within special remedial settings employing highly trained personnel. The three approaches described below are well known and are usually included within the repertoire of professionals who work in specialized programs. It should be noted, however, that most of the programs are actually collections of many techniques.

Orton-Gillingham. Systematic descriptions of unusual treatment procedures were lacking until Dr. Samuel T. Orton (e.g., 1925; 1929; 1937) coined the term strephosymbolia to refer to reading disability characterized by reversals which persisted after the period of beginning reading instruction. He based his notion of etiology on Broca's hypothesis that language is controlled by the hemisphere of the brain opposite the skilled hand (1861). Orton observed that confusion in writing and spelling was also evident in such readers and considered the entire syndrome to be a manifestation of incomplete dominance of the appropriate side of the brain. The procedures suggested by Orton and his followers Anna Gillingham, Bessie Stillman, etc. were originally advocated for those who failed to read with a "sight reading" approach that included phonics instruction only incidentally. It was also suggested that the content and methodology of their treatment procedures be used as a beginning reading program to prevent failure.

The Orton-Gillingham approach involves careful programing of a specified sequence of visual-auditory-kinesthetic associations. A concomitant writing and spelling program is also included.

During the suggested retraining period it is recommended that all other reading be discontinued. Adherence to the program sequence is urged to the extent that the omission of any step in the sequence is considered to jeopardize the success of the learner.

Because of the necessity for careful monitoring of individual student response, attempts to use the procedures in a group situation imply either additional personnel or changed management practices. The public schools of Bloomington, Minnesota have incorporated a group adaptation for use in regular classrooms (Enfield, 1970).

Usually, however, the system is recommended for clinical use, as in the Scottish Rite Hospital in Dallas (Cox, 1971).

The etiological rationale for the "strephosymbolia" approach has been shown to be of questionable validity (e.g., Balow, 1968). The methodology, however, continues to enjoy popularity. Case studies of followup of those involved in this kind of remediation are presented by Margaret Rawson (1968) of the Orton Society. Many of the key elements of the program, e.g., use of phonic word patterns such as hide, ride, etc., are incorporated into some of the current basic reading programs. Full description of rationale and methodology is available in a teacher text by Gillingham and Stillman (1960).

Fernald. The approach developed by Grace Fernald (1943) has been associated with that of Orton-Gillingham, but it is actually quite different both in rationale and in methodology. Assuming that reading disability occurs for a variety of reasons, attention is focused upon remedial techniques both for the totally and partially disabled reader. Partial cases are considered the most troublesome because of the necessity for unlearning poor habits.

With the Fernald method a complete multisensory procedure is used. Visual, auditory, tactile, and kinesthetic modalities are employed as the learner traces and overlearns words he wishes to know or words familiar to him. While the methodology is sequentially structured, the content need not follow patterns as required by the Orton-Gillingham technique. Like the approach described previously, spelling and writing are taught along with the reading.

The Fernald approach may be used in modified form for group work, but it is primarily a method suited to a clinical or one-to-one tutorial setting. In contrast to the Gillingham program, there is no specific recommendation for using the technique as a preventive classroom measure. However, the continuous emphasis upon providing success experiences by finding differing ways in which individuals do learn is suggested as a means of providing success with life demands such as "schoolwork."

Fernald's idea regarding the use of content which interests the learner is found in the language-experience approach to beginning reading. The multisensory feature is found in some current developmental reading programs and has been antedated partially as a feature of Montessori methodology (e.g., Standing, 1962).

Data of case studies are available in the basic teacher-text written by Fernald (1943). Unlike those interested in reading related behaviors alone, Fernald has also attended to mathematics and the general problems of school failure.

N. Dale Bryant. A more recently developed clinical approach which deals directly with reading behavior is that of N. Dale Bryant (1965). Viewing dyslexia as a severe disability in word recognition without reference to etiology, he suggests that many methods and materials can be effective in the instructional situation as long as there is adherence to the basic remedial framework.

The Bryant remedial framework itself was derived from clinical experience and describes principles dealing with gross content and with methodology. Content is concerned with the perception of elements within words and with sound-symbol associations. Methodology is governed by the provision of success experiences, careful monitoring of student performance, overlearning, the development of successive discriminations, and integrated review.

The context within which the remediation occurs requires such close supervision and continuous planning that, as with previous approaches, the management of such a program in a classroom situation would be difficult. The principles advocated, however, are part of the contribution of clinical practice to the design of classroom procedures.

Implications. The three representative clinical approaches described above differ in some respects, yet are similar in that they all require or provide:

1) the attention and involvement of the learner

2) planned success experiences, including immediate restructuring of an inappropriate task

3) consistent and continuous positive reinforcement for appropriate responses

4) immediate feedback to the learner

5) overlearning of basic response units

6) multisensory stimuli and/or responses

7) interpersonal involvement

8) the confidence of the clinician and/or the learner in the methodology

It is not known which element or which combination of elements is responsible for the successes reported in clinical work. It is likely that future conceptualizations of the clinical approach will view them as a repertoire of broad considerations to be accounted for in the remedial situation.

Correlate or prerequisite approaches

Some clinical recommendations do not deal directly with alphabetic symbols and their meanings; yet they are considered remedial because they are concerned with presumed correlates and/or prerequisites to the direct acquisition of reading behaviors. The four approaches described below are broadly representative of the developmental or maturational lag position discussed in Chapter Two.

Neurological organization. Primitive levels of neurological organization are the focus of the work of Doman, Delacato, et al. (e.g., 1959; 1960; 1966). Their treatment strategy is based upon the assumption that improperly or insufficiently developed neurological functions can be brought to the development states observed in normally functioning children.

After neurological examination under the direction of specifically trained personnel, locomotive behaviors such as walking, creeping, crawling, etc. are observed. Through these observations and parental reminiscence, the current and previous success of the child at each of the tasks represented in the clinical program is charted. Instruction is begun at the earliest hierarchical level at which a skill was not observed. There is an assumption that even if subsequent skills did develop, they were improperly structured because of the sequential interdependencies of developmental stages. Either at the home with periodic re-evaluation at the clinic or in the clinical setting, a highly structured program of activities is initiated in which the limbs of the learner are moved by a team of persons to conform to the appropriate movement pattern. It is assumed that this external patterning will result in an internal and corresponding change in neurological organization.

A direct instructional program in reading is begun when "correct" functional motoric behavior has been produced. The reading program is largely associational in nature so that words naming objects within the learner's environment are mastered first. It is also

suggested that young children who have developed appropriate neurological organization can be taught to read much earlier than the traditional age of school entrance.

Of all approaches to remediation, the Doman-Delacato strategy remains the most controversial. The data presented in support of the treatment have been questioned by the academic community in terms of the appropriateness of the experimental design (e.g. Glass and Robbins, 1967). Where replication of reported clinical procedures has been attempted, conditions have not been sufficiently controlled to be called identical; yet replicability is a sine qua non of the research enterprise. It is anticipated that controversy regarding the Doman-Delacato programs will continue.

Perceptuo-motor readiness. Kephart (1963) and his followers are interested primarily in stages of development that occur after the basic movement patterns of the Doman-Delacato program. He suggests that the establishment of certain relationships between the body and gravitational forces is essential to the development of perceptual and conceptual abilities. Physical exercises and gross motor training are recommended as either remedial or preventive treatment. It is hypothesized that until perceptuo-motor development in spatial dimensions and temporal sequences has been accomplished, the learner will continue to have difficulty in perceiving order in the environment. Part of that environment would include the spatial relationships of letters and words and the temporal sequences of sound blending and the order of ideas.

Although originating as a clinical program, elements of perceptuo-motor training have been incorporated into developmental physical education programs in public schools. The notions and modifications of perceptuo-motor techniques have been of increasing interest to physical educators. Where the field was once considered as ancillary to the academic program, the activities are increasingly proposed by educators as an integral, essential part of academic growth.

Physical therapists such as Ayers (1964) have been responsible for that profession's growing interest in the relationship between motor integrations and academic success. Specialists within the profession are currently being trained to work in public schools to develop remedial and preventive programs of physical development.

Because of the visual aspect both of the act of reading and general coordination involved in perceptuo-motor activities, ophthalmologists

and optometrists also have become increasingly involved in public school programs. However, at a recent conference, a group of ophthalmologists issued a statement to the effect that ophthalmology as a profession was interested solely in ascertaining the healthy, functioning state of the eye. Dyslexia to this group fell within the province of the educator (not the physician) to diagnose and treat as he (the educator) defined the phenomenon (Kettering Foundation, 1969).

In optometry, an interest in perceptual problems possibly related to reading problems has become an area of specialization. (Vision is probably more closely concerned with the visual-perceptual approach but is placed here because of the background of interest in perceptuo-motor functions.) Some optometrists have developed their own programs, with no reports of validation, designed for use by educators. Eye-movement training and special lenses have also been recommended by some members of this group.

Functional relationships between improvement in perceptuo-motor performance and reading remain to be demonstrated reliably. The effects of most of the treatments recommended by this group of interested personnel, either in education or in related professions, have not been sufficiently assessed to warrant their wholesale or automatic inclusion in clinical or in school programs.

Research is needed concerning the functional nature of the relationship between perceptuo-motor activity and reading behavior. At present, only moderate correlational evidence is available.

It would also seem desirable to investigate the phenomenon of the process of persuasion as it relates to the adoption of educational practices. There is a current tendency for some educators and parent groups to initiate programs of perceptuo-motor training in lieu of direct instruction in reading, with effectiveness evaluated solely in terms of "satisfaction" by schools or parent groups. Satisfaction may prove to be a crucial variable in instructional improvement, or conversely, a barrier to changes that would bring about instructional improvement. In this case, traditional research should probably be supplanted or at least supplemented by evaluation designs which can account for the needs and desires of the total educational system, including parents and the community.

Visual perception. Perceptual theory deals partially with the characteristics of objects as they appear to an observer. Many theories are advanced to account for the processes underlying

perceptual experience (e.g., discussions in Koch, 1959). Yet all are in some way concerned with five general characteristics of the perceptual experience. Form refers to the classification of elements so that relationships are set up, providing order to experience. Object constancy is concerned with the stability of a perception even though the perceived object appears vastly altered in angularity, magnitude, or distance. Position in space is related to the spatial orientation of the observer. Magnitude involves quantification along dimension such as size, pitch, intensity, etc. Individual relevance for the observer is called meaning.

Some of the principles explorable from the psychology of perception have been related to reading behavior. Marianne Frostig (e.g., 1964) has produced a test (1964) and a program of activities (Frostig and Horne, 1964) intended primarily for use with young school-age children. The purpose of the program is to assist with the learning of what she considers to be concepts and/or structures of visual perception appropriate to the developmental educational task requirements. Some body movement and body-image activities are included. However, the Frostig approach is primarily a paper-and-pencil medium for systematic instruction in attention to the visual cues necessary to the consistent experiencing of two-dimensional representation of objects.

The particular perceptual structures specified in this program are eye-motor coordination, figure-ground discrimination, form or shape constancy, position in space, and spatial relationships. These areas are essentially those of Gestalt psychology.

Frostig activities have been used as a prereading program, as a substitute reading program, and as a supplement to the developmental reading program. There is an assumption that the use of the materials per se will prevent or remediate behaviors such as reversals and inappropriate visual discriminations.

In addition to their use with young children, the activities are frequently recommended for the reeducation of older children who, according to performance on the Frostig test, appear to be deficient or lagging in perceptual development. This particular practice is questionable because of the very different nature of the child in a remedial situation, i.e., memories and expectations about reading are usually built up so that the remedial reading tasks are not comparable to those arranged for the "instructionally naive" school beginner. Research reports consistently indicate that the Frostig

approach does not facilitate reading growth (e.g., Wiederholt and Hammill, 1971).

Although intended for use in assessing the developmental status or else varied abilities within an individual child, the testing portion of the program has come to be used as a classification device much as a substitute for IQ tests. In some instances children are segregated into special classes on the basis of a Frostig test score only. A prognosis for success in early reading is also made by some as the result of overdependence on the meaning of one test score.

Unfortunately, program developers cannot control misapplication by program users. Accountability and evaluation designs may, however, focus attention upon the appropriateness and effectiveness of such programs as they are related to the goals of the local district.

Language behavior. A fourth example of indirect treatment for reading is that of language behavior. Reading is a part of the language function and is considered to be influenced by and in turn to influence other areas of language activity. The Parsons Language Sample, or PLS (Spradlin, 1963), and the Illinois Test of Psycholinguistic Abilities, or ITPA (Kirk, McCarthy, and Kirk, 1961; 1968) were the first well known systematic attempts to assess language as a communication process rather than a learned content.

Of the two, the ITPA has achieved greater popularity as a diagnostic instrument upon which remedial programs are based. Like the Frostig test, it was originally designed as a means of evaluating intralearner variability among several areas of language functioning. It, too, has since become a means of classifying and segregating children for sometimes inappropriate differential instruction.

The ITPA is basically organized to sample the processes of receiving language stimuli, or decoding; integrating new information into previously learned cognitive structures, or associating; and emitting a response presumably connected with previous decoding and associational activities, or encoding. The information involved is considered to be either automatic-sequential or representational in the sense of the degree to which the person must consciously structure his responses. Channels of communication are the sensory media through which the information is decoded, associated, or encoded. These channels include visual, auditory, motor, and vocal. A two

channel combination such as visual-motor is always used for the association process. Not all possible combinations are included in the ITPA, and the current edition (1968) has added tests of Visual Closure and Sound Blending.

The most widely used materials related to the ITPA model are found in the Peabody Language Development Kits (Dunn, et al., 1965; 1966; 1967; and 1968). The programs are designed primarily for the classroom teacher to use in a preventive approach to language disability. Of perhaps greater significance than suggesting materials which correspond to ITPA categories has been the role of dimensions of channel, level, and process postulated in the test. They have served as a conceptual guide for the analysis of task and response elements in the instructional process regardless of materials or methodology used.

Implications. The four approaches described above are representative of a pervasive interest in the interaction of "readiness" variables with reading instruction. They also reflect an increasing focus upon variations within the individual learner in addition to the traditional "individual differences" among persons. Unfortunately, uninformed and indiscriminate adoption of programs these approaches represent has frequently obscured their original intent. The claim that these or similar programs are "new ways of reading" that eliminate the need to be concerned with analysis of the developmental reading program are unwarranted.

High visibility approaches to treatment: summary

All of the approaches described call attention to the need for observation of the responses of the learner. The value of any of these programs may not lie in the specific matching of program to learner deficit or ability, with research yet to demonstrate such a correspondence. It may be that their value occurs as those who work with children begin to expand their own concepts both of the child as a learner and of the instructional management arrangements necessary to provide a learning environment which maintains the probability of his learning success.

RECASTING THE CLINICAL PROCESS

While preventive efforts move toward improvement of basic reading programs for all children, there continues to exist a need for providing remedial services for children who have experienced failure with the curriculum offered locally. Dissatisfaction with existing clinical methodology has occurred primarily because efficacy studies have failed to show lasting effects of remedial attention. Interest in the conditions under which clinical instruction occurs has recast the model of the clinical process from the formerly separated diagnosis and remediation to a continuous cycle analogous to a series of hypothesis-testing situations. Serious consideration of and training in the newer conceptualization of the clinical process has not yet received the serious attention of reading education programs or researchers.

Dissatisfaction with existing models

The classic literature reading the efficacy of remedial reading programs has consistently suggested that continued support is necessary to maintain whatever gains have been made (e.g., Balow, 1965). Usually the explanation for lack of continued improvement implies that there is something within the child which causes him to respond positively in one setting but not in another. It would, however, be equally plausible to hypothesize that transfer from one situation to another was not made a part of the "remedial reading" program. Bandura (1969) and Gagné (1966) have called attention to the importance of acquiring requisite competencies through the setting of optimal learning conditions. Bandura then emphasizes that ". . . the likelihood is exceedingly small that favorable self-attitudes, however induced, could survive in the face of disconfirming performance experiences (p. 615). Remedial programs have been considered as preparing the "dysfunctioning" learner to succeed in the ongoing broader system. Transfer to that system may or may not have been considered.

An alternative model views the system as modifiable to accomodate individual differences. Adamson and Van Etten (1970) reported a Title III project in which an M & M (methods and materials) teacher was used to observe the referred child in the classroom and to work with him individually to determine how he could best learn the target skills such as classroom reading or spelling activities. The child and the classroom teacher were assisted with incorporating

the suggested or modified procedures, until collected data indicated that the procedures were successfully and independently maintained.

The traditional clinical process has been criticized for various reasons. Lovitt (1967) has suggested that no teaching obligation follows the labeling type of diagnosis. In fact, a label may be used as an excuse for not teaching (p. 234). It has been reported previously that the quality of remedial service is questionable when the service is in a training clinic (Cawley, 1967). Neither is there a uniformly accepted idea of quality within a public school remedial program.

Leach (1969) has also questioned the sacrosanct nature of the clinical process. He referred to its privacy, suggesting that this secret aspect serves to protect the poor clinician; it does not allow for self-evaluation; it does not lead to self-improvement; and it does not advance the science of remediation because of nonreplicability and nongeneralizability of the procedures used.

Strang (1968) has also critiqued current practices, suggesting that the separation and lack of communication between diagnosis and remediation activities are detrimental to the child. She shares Leach's concern for the inaccessability of clinical process so that it is amenable neither to accurate description nor to assessment.

Beller (1962) in his concern for the development of improved data collection techniques for research in childhood personality disorders has analyzed the importance and function of the structure of clinical records when he states that, "Such records constitute an essential tool of the human intellect, in that they supplant memory, facilitate evaluation, and eliminate useless repetitions" (p. 4). He further suggests that where selective recording of observations is not present: (1) unknown sources of variation in data arise from case to case; (2) where concepts of the field are vaguely defined, resulting inconsistency and latitude of practitioners increases unknown sources of variation; (3) variations in informational content may reflect differences in a clinician's focus of data gathering; and (4) data gathering is biased in different clinical settings toward specific etiology, diagnosis, and treatment (p. 10).

Reformulation of the clinical process: Lovitt

Lovitt (1967) and Lovitt & Curtiss (1968) have described and have employed the general methodology (described below) in their work with learning disabled children at the Experimental Education Unit of the University of Washington. Their four-point continuous evaluation procedure involves (a) baseline assessment; (b) assessment of behavioral components; (c) assessment based on referral; and (d) generalization of assessment.

Baseline assessment requires that observations of the behavior in question be recorded until it becomes stable. For example, if a child does not "know" a word, the word can be presented within different syntactical contexts, with different type faces, in isolation, etc., to determine that the word was either consistently unrecognized or that it was recognized under certain identified conditions. Reliability and validity of assessment are obtained through direct observation until stabilized performance occurs.

Assessment of behavioral components deals with the elements that modify or maintain behavior. These elements might be books, papers, workbooks, tapes, etc. Modality or any aspect of the way in which the units are presented is also considered here.

Response behaviors refer to what the child does or is expected to do when presented with the stimuli. The following behaviors are included: the regularity and/or frequency of the child's response; the form of the response, such as vocal or written, etc.; and the effect of his response, such as vocal or written; and the effect of his response upon his environment, i.e., is material re-presented? a gold star given? a frown made? etc.

The contingency system, or the temporal arrangements of the consequences of the response, are emphasized by Lovitt:

> . . . these same lean and unsystematic contingencies that maintain acceptable response rates in normal children may be either too subtle or too infrequent to evoke similar behaviors in exceptional children (p. 236).

Subsequent or consequent events refer to those events which either increase or decrease the behavior. Teachers have long used social praise, treats, engaging in fun activities, etc., as consequent events contingent upon appropriate responses to the stimuli

presented. Difficulty arises when treats are inconsistently or noncontingently given. It is vital to determine through continuous collection of observable data which events do in fact accelerate or decelerate behavior. Some teachers have complained that the administration of punishment as a subsequent event had no effect upon the behavior in question. What is considered a punishing or a positive consequence by the observer may be shown by data to have had no effect, or an opposite effect with an individual child.

Assessment based on referral is the third factor described by Lovitt. It means that the referring agent, e.g., teacher or parent, should be assessed to determine whether he is deficient in the skills necessary to manage the child's behavior. It is also crucial that the remedial agent and the referring agent share goals and understanding of the process of instruction. Otherwise the child must discriminate between successful performance in separated environments, and fractionization of the remedial system minimizes the probability of successful treatment.

Generalization of assessment is Lovitt's fourth aspect. Unless the referring agent or the teacher has available an accurate, useable description of the procedures to be followed, as well as some indication of their management within the instructional situations, there is little likelihood of their being carried out effectively.

Reformulation of the clinical process: Reese and Leach

A related discussion of a more detailed model for learning, or for teaching, is presented by the psychologist Reese (1966, Pp. 49-57). She suggests the use of a series of procedures to assist the learner in functioning to the presumed limit of his capabilities, while at the same time not making unreasonable demands upon him.

Leach's generalized clinical session model (1969) used in the speech and hearing clinic at Indiana University is just as applicable to the clinical process in reading. It involves seven basic steps:

1) The child presents a problem for analysis.

2) A tentative solution is planned.

3) The "solution" is applied during management of the clinical session.

4) Progress is evaluated with numerical data collected to describe trials, response to reinforcements given, units learned, and any other appropriate target behaviors of the session.

5) The relationship between progress (4) and management (3)is determined so that the next session might be replanned and preplanned.

6) Progress with the individual child is related to the generally known literature of the basic presenting problems, thus, improving the state of the art or science.

7) Replication of the procedure is mandatory to determine reliability and generalizability.

It should be especially noted that a model such as that advocated by Leach has the builtin advantages of making the clinical process (as he suggests is necessary) self-validating, self-evaluating, self-improving, etc.

Implications for the practitioner. Throughout these three promising models of clinical process, i.e., Lovitt, Reese, and Leach, there are common threads which may be used by the practitioner to improve instructional management of reading. The procedures described have occasionally been referred to as mechanistic. They are, rather than mechanistic, reliable and precise.

Systematic observation of the child is insured as the teacher collects data regarding what the child knows, what he does not know, how he approaches the learning task, and what management practices assist with maintaining the desired behavior. Rigg and Rigg (1967) have provided excellent clinical descriptions of several "types" of children, suggesting the management practices which promise the highest probability of success with each.

The idea of the learner's preference becomes extremely important in systematic approaches to assessment. For example, if stimulus choices are provided in the form of books, comic books, magazines of varying types, experience stories, catalogues, etc., the child can be free to make personal selections, and the teacher can empirically determine his reading preferences. If a child thoroughly enjoys arithmetic but does not attend to reading work, doing math may be made contingent upon successful completion of reading work.

Classroom application of this Premack (1959) notion is explained in greater detail by Neisworth, Deno, and Jenkins (1970).

Through task or process analysis as described in Chapter Three, the teacher can break down the learning activity into steps, units, modalities, etc., that are manageable by the child. It is essential to begin instruction within the child's capabilities, moving gradually to more difficult or more complex tasks. These ideas and others are expanded upon as application of a clinical process model to both tutorial and group situations as described by Stephens (1970). Johnson and Myklebust (1967) have also presented a self-evaluative model of instruction.

If the practitioner is not the agent who performs the initial assessment of the child, he should not hesitate to demand both a content and management plan for carrying out the recommendations. Such a plan should consider all those who are available to produce or maintain the desired learning.

In addition, if the teacher does not have either the content knowledge or management skills to handle the instructional situation, he should request such assistance. It might be obtained from the school psychologist, from independent reading, from colleagues, through inservice training, or through college coursework.

Improvement of teacher performances rather than time spent in inservice should be reinforced by administrators and supervisors. This important aspect of service delivery improvement also implies that the local district be willing to expand the personnel, time, and money necessary to improve the monitoring of teacher behavior.

Perhaps the most significant application of diagnostic process is the set for discovering how the child can be helped to learn, i.e., under what conditions learning does in fact occur. The usual question of why learning has not occurred takes on a meaning different from the notions of internal etiology. The "etiology" in this case becomes a "condition of learning" deficit, with valid and reliable evidence to support it.

Viable procedures such as those described in the present chapter are sufficiently developed to be of value in teaching reading teachers as well as in teaching those teachers' students. More generalized program evaluation models extend continuous evaluation from individual assessment to the analogous broader consideration of the

functioning of the training system as a unit. Such generalized methodology could also be applied to determine the conduct of a remedial service.

Recasting the clinical process: summary

The recasting of clinical process suggested in the last portion of this chapter has emphasized competence in the discriminative selection and use of diagnostic techniques, the ability to provide correspondingly appropriate instructional experiences, and continuous reevaluation of individual programing.

Other models hypothesizing specific relationships between stimuli, or the remedial task, and expected responses of the child (e.g., Smith, 1968; Valett, 1969) are only guides to assist the clinician with hypothesizing the content of the clinical session. The clinical procedures described here are more complete, however, because improvement and evaluation are built into the models themselves. By making the practitioner a researcher of socially important behaviors, true professional status with proof of competency is possible. Self-improvement and self-evaluation are viewed not as indications of incompetency but as valuable traits to be respected and encouraged. The clinical process itself is thus visible, analyzable, generalizable, exportable, and amendable.

SUMMARY AND IMPLICATIONS OF TREATMENT APPROACHES

This chapter has placed approaches to treatment of reading disability within the context of expanding considerations of the nature of reading program variables and the structure of the clinical process. Both interventive and preventive programs have become increasingly concerned with interaction between the learner and his instructional environment, regardless of setting.

Remedial procedures within the traditional literature are viewed as being neither effective nor ineffective per se. They are clearly inappropriate for recommendation without adequate determination of treatment efficacy within an instructional situation which would expact and demand improvement in the performance of the individual learner. Treatment then becomes synonomous with diagnosis in the sense that the form and rate of the learner's response to (or lack of response to) specific content, methodology, or management practices determine the nature of continued treatment.

The scope of competencies of the practitioner are being broadened from knowing "the" content and presenting "it" to the learner. Rather, the practitioner is seen as one who has available alternative content, alternative methodologies, and alternative management procedures to be used tentatively for systematic validation and revision with an individual child.

In terms of research effort perhaps the greatest single problem lies in the absence of a behavioral data collection structure which would permit clear communication regarding the conduct of the instructional process. Without a data base it remains impossible to determine specific elements which effect success or failure with chosen tasks.

The technology (such as videotape) is available to reinstate behaviors as they occur in the treatment programs, making possible detailed analysis of that process. Effective teacher or learner components, once identified, are amenable to training. Programs of teacher education are currently based primarily upon likely course titles, with the content of such courses idiosyncratic to the education instructor. Research in training practices continues to be a void in the service delivery system.

Local school districts faced with the problems encountered in the improvement of developmental or remedial instruction are for the most part powerless to help themselves. They continue to be enmeshed in a system which does not lend itself to "troubleshooting," or self-evaluation and self-improvement. Improvement is beginning to appear in the development of bases for making decisions about content, methodology, and management practices. Improvement is not as readily forthcoming in the problems of personnel training and the evaluation and manipulation of service delivery system components. Treatment of reading disability is likely to remain fragmented and subject to local whim or exigency until these problems receive their necessary share of time, talent, and financial resources.

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Chapter 5
SUMMARY

The controversial term dyslexia has been interpreted, misinterpreted, and left uninterpreted by those who represent a variety of interests in people and enterprises related to the field of reading. The current power of one work to evoke the intense emotional reactions associated with the term is perhaps in itself reason for publication of a professional statement delineating or moderating the controversy. Implicit in the role of the professional, however, is the responsibility for providing more than a reactive response to emotionalism. The professional task is to generate an appropriate analytic framework within which historical, current, and projected information might be cast for the purpose of providing discipline to diverse concerns and inquiries. It is to the problem of creating such a structure that the present monograph has been addressed. As such, no exhaustive treatment of the literature was intended. Rather, purposely selected exemplars ranging from faith to tentative fact provide substantive reference for the analytic considerations provided by the authors.

It has been suggested that the historical and current preoccupation with intraorganismic etiologies and correlates of reading achievement has at times been detrimental to the task of improving the conditions under which reading instruction occurs. This position is not to be construed as suggesting that medical, linguistic, and other related problems do not need or deserve attention. It does mean that such activities should not be considered in lieu of direct instruction in the process of reading.

As the remedial process has become more visible and analyzable traditional conceptions of separate diagnosis and treatment have become untenable. Even if hypothesized matches of pure treatment to pure deficit could be specified, the individual ramifications of the management and generalization processes suggest that other approaches are more desirable. Decision-making models with a repertoire of alternatives for each decision point are now available.

While the models vary, they share the common feature of providing a framework which is public, teachable, and reproducible, and within which validity and reliability of the separate activities of the clinical or experimental process can be evaluated.

Rather than re-invent the wheel, practitioners at the training level are encouraged to benefit from the results of research in training which is carried out by areas other than reading.

The increased "legitimacy" of training as an area of educational research should result in improvements in training programs. As people interested in similar problems collaborate, new lines of specialization may occur--quite different from those historically derived.

It is becoming apparent that a program of consumer education needs to be developed in the field of reading. Those specialists who are in a position to interpret and relay basic information to others have a responsibility to check the accuracy of such information. Consumer education is also essential in determining the rationales for purchase of instructional materials and supplies. Unless practitioners are taught to analyze materials in terms of their effectiveness in instructional situations, manufacturers will continue to respond to the dollar reinforcement provided by the well-meaning but poorly informed consumer. Whether or not accountability trends will be able to change this situation remains to be seen.

Philosophical values also enter into any consideration of reading disability. Ideas of continuous progress, criterion testing, success experiences, etc. require a radical change in the conceptualization of success. The continued use of arbitrary grading practices based upon normal curve distributions or relative intraclass positions are highly resistant to extinction, primarily by those at the upper segments of the achievement curve. While achievement for "all" is a principle, it is seldom considered a realiatic practice.

The practitioner should remember that emphasis upon instruction in reading does not imply that a program or procedures with which a child has failed should be continued. Alterations, sometimes very unusual alterations, may need to be made in the teaching-learning situation until improvement is shown.

It may also mean that it might be more humane, where the human cost of reading instruction is so high, to consider alternatives (other than reading) to the acquisition of knowledge. Prosthetic devices such as tape recorders, pictures, etc. may be inefficient but better for some older youngsters who are not able to participate in an optimal instructional program.

Several negative expectations need to be dispelled by the practitioner. The first involves an expectation that some "cause" will be found to explain poor reading ability on grounds other than instruction. Clinical reports are frequently loaded with reasons why the child cannot learn, but they seldom specify the arrangements under which he does learn. Training programs such as those in school psychology are requiring that psychological reports to practitioners contain only statements and recommendations specifying what educational tasks the child is ready to learn and how he can be taught to learn them.

There is no closure as such to this monograph with the exception of stating that we are now at least technologically prepared to effect major improvement in the total reading instruction effort. The problem at this time is to attend to the economic, legal, and sociological conditions which prevent the implementation of the resources available. The alternative is to accept the limited level of literacy possible within conditions we willingly tolerate.

Additional references

SELECTED ANNOTATED READINGS

The entries presented as suggested readings involve a variety of topics related to the present monograph and are representative of many of the options of current thinking in the study of reading disability. They should be read carefully and discussed or argued thoroughly with others before the student can have a working knowledge of the ramifications of one point of view or another. All the entries have extensive bibliographies to further entice the serious student.

Adelman, H., and Feschback, S. Predicting reading failure: beyond the readiness model. Exceptional Children, 1971, 37, 349-54.

Examines the conditions under which beginning reading instruction occurs. Standardized testing is insufficient to account for the environmental factors which are idiosyncratic to a classroom setting.

Critchley, M. Developmental dyslexia. London: William Heinemann Medical Books, 1964.

The classic historical account of interest by the medical profession. The role of the educator is clearly differentiated from that of the neurologist.

Desberg, P., and Berdiansky, Betty. Word attack skills: review of the literature. Inglewood, Calif.: Southwest Regional Laboratory for Educational Research and Development, 1968.

A comprehensive review of present and projected concepts and examples of word attack skills. Both rationales for the current content of teaching and the possible directions of content change, as suggested by basic psycholinguistic research, are presented.

Farr, R. Reading: what can be measured? Newark, Delaware: International Reading Association Research Fund, 1969.

A state of the art monograph critically reviewing measurement practices in the field of reading. Misapplications of testing concepts are described, and suggestions for future research are proposed.

Gephart, W. Application of the convergence technique to basic studies of the reading process. Washington, D. C.: National Center for Educational Research and Development of the Office of Education (HEW) Project Number 8-0737, 1970.

The report of a multidisciplinary group who used a Convergence Technique to determine needed targets of research in reading education. A master guide is suggested for coordinating and integrating pieces of research into models of the reading processes, with the ultimate goal of insuring at least minimal literacy skills in the United States.

Goodman, K. (Ed.) The psycholinguistic nature of the reading process. Detroit: Wayne State University Press, 1968.

A book of readings describing alternative models for conceptualizing the nature of the reading process within a psycholinguistic framework. Research reports and discussion articles especially concerned with the relationship of graphemic systems to other language functions are included.

Gray, Susan. The psychologist in the schools. New York: Holt, Rinehart and Winston, 1963.

A foresighted analysis of the ecological and sociological approach to child-helping professions. Changes in roles for school personnel are discussed from the point of view of the school psychologist.

Lovitt, T. C. Assessment of children with learning disabilities. Exceptional Children, 1967, 34 (4), 233-39.

A description and explanation of the process of assessment. Diagnosis and remediation are made cyclical and

continuous, with all components of the instructional process individually assessed to determine whether each should be maintained or modified.

Myers, Patricia, and Hammill, D. Methods in learning disabilities. New York: John Wiley, 1969.

A descriptive overview of popular developmental and remedial programs, or systems, available for children with learning problems. The approaches are analyzed and then placed into a model of language functioning.

Stephens, J. Directive teaching of children with learning and behavioral handicaps. Columbus, Ohio: Carles E. Merrill Co., 1970.

Contains practical teaching techniques for maximizing the learning environment in a classroom or tutorial setting. Teachers will appreciate the concrete examples of improvement of classroom practices.

Strang, Ruth. Reading diagnosis and remediation. Newark, Delaware: International Reading Association Research Fund, 1968.

A state of the art monograph reviewing research associated with reading disability. The separation of diagnosis from treatment is considered to be inappropriate for maximizing learning opportunities.

Templeton, A. B. (Chmn.) Reading disorders in the United States, a report of the Secretary's (HEW) national advisory committee on dyslexia and related reading disorders. Bethesda, Md.: National Institute of Neurological Diseases and Strokes, 1969. (mimeo)

A multidisciplinary panel's review of the status of reading education and their suggested directions for government support of reading program improvement. Recommendations are made for a network of research and development centers, procedures and programs for identification and remediation of reading problems, and increased quality and availability of researchers, specialists, and teachers.

Tyler, R., Gagné, R., and Scriven, M. Perspectives on evaluation. AERA Monograph Series on Curriculum Evaluation (1). Chicago: Rand, McNally, 1967.

Contains abstract discussions of varying approaches to program evaluation. Differences between evaluation activities and classic research design are presented, along with critiques of the problems of setting up evaluation capabilities.